

Claims:

1. An electrically-adjustable RF delay element, comprising a splitter to split an input signal into two signal paths, one signal path providing a delay fixed at an integral number of wavelengths of a desired center frequency and both signal paths providing electrically-adjustable attenuation, and a combiner having two inputs and an output for combining signals passing through the signal paths, such that the sum of the electrically-adjustable attenuation provided by the signal paths adds to unity, whereby the input signal is delayed by an adjustable time depending upon the attenuations provided by the signal paths and is provided at the output of the combiner.
2. The electrically-adjustable RF delay element of claim 1, the splitter and signal paths comprising a balanced variable attenuator and an RF delay element having a delay fixed at an integral number of wavelengths of a desired center frequency, wherein the fixed delay element is connected between port 3 of the balanced variable attenuator and a first input of the combiner and a second input of the combiner is connected to port 2 of the balanced variable attenuator, whereby an RF signal applied to port 1 of the balanced variable attenuator is delayed by an adjustable time depending upon the degree of attenuation provided by the balanced variable attenuator and is provided at the output of the combiner.
3. The electrically adjustable RF delay element of claim 2, wherein the balanced variable attenuator comprises identical shunt-mounted reflective attenuators connected between a pair of quadrature hybrid couplers.
4. The electrically adjustable RF delay element of claim 3, wherein the shunt-mounted reflective attenuators are PIN diodes.
5. The electrically adjustable RF delay element of claim 2, wherein the balanced variable attenuator comprises identical series-mounted reflective attenuators connected between a pair of quadrature hybrid couplers.
6. The electrically adjustable RF delay element of claim 5, wherein the shunt-mounted reflective attenuators are PIN diodes.
7. A method for providing an electrically-adjustable delay of an RF signal, comprising:

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splitting the RF signal into two intermediate signals;

delaying one intermediate signal by a fixed integral number of wavelengths of a desired center frequency;

attenuating both intermediate signals by electrically adjustable attenuation factors such that the sum of the attenuation factors is unity; and

combining the intermediate signals into an output signal.